CLAIMS

We claim:

1. A compressor, comprising:

a compression cylinder adapted to receive fluid from a suction port and to urge the fluid out of a discharge port;

a moveable member within the compression cylinder for compressing the fluid within the cylinder and urging it out of the discharge port; and

a variable clearance volume chamber in fluid communication with the compression cylinder, the chamber having a selectively variable volume for containing a correspondingly variable amount of the fluid.

2. The compressor of claim 1, wherein the variable clearance volume chamber includes a moveable wall portion that is selectively moveable between a maximum volume position and a minimum volume position.

3. The compressor of claim 1, wherein the moveable member comprises a piston that reciprocates within the compression cylinder and wherein the variable clearance volume chamber is positioned to receive fluid from the compression cylinder as the piston moves in a direction to urge the fluid out of the discharge port.

4. The system of claim 1, including a controller that selectively controls the volume of the variable volume within the compressor.

5. The system of claim 4, wherein the controller determines an ambient air temperature and responsively controls the volume in the compressor.

6. A water heater system, comprising:

a gas cooler having a heat exchanger that facilitates transferring heat between a refrigerant and water;

an evaporator having a heat exchanger that facilitates transferring heat between ambient air and the refrigerant;

an expansion device between the gas cooler and the evaporator; and

a compressor that draws the refrigerant from the evaporator, pressurizes the refrigerant directs the refrigerant it to the gas cooler, the compressor including a variable clearance volume for selectively controlling a mass flow rate of the refrigerant.

7. The system of claim 6, including a controller that selectively controls the volume of the variable volume within the compressor.

8. The system of claim 7, wherein the controller determines an ambient air temperature and responsively controls the volume in the compressor.

9. The system of claim 8, wherein the controller controls the size of the variable clearance volume to change the mass flow rate of the refrigerant to maximize the system performance

10. The compressor of claim 6, wherein the variable clearance volume chamber includes a moveable wall portion that is selectively moveable between a maximum volume position and a minimum volume position.

11. The compressor of claim 6, wherein the moveable member comprises a piston that reciprocates within the compression cylinder and wherein the variable clearance volume chamber is positioned to receive fluid from the compression cylinder as the piston moves in a direction to urge the fluid out of the discharge port.

12. A method of controlling refrigerant flow in a water heater system, comprising:

selectively varying a clearance volume in a compressor responsive to an ambient air temperature condition.

13. The method of claim 12, including decreasing the clearance volume responsive to a decreasing ambient air temperature condition.

14. The method of claim 13, including decreasing the size of the clearance volume to a level to maximize the system performance

15. The method of claim 12, including increasing the clearance volume responsive to an increasing ambient air temperature condition.

16. The method of claim 15, including increasing the size of the clearance volume to a level to maximize the system performance.